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NOTE:

Copy of FR 2,233,032 translation

**Case (or Shelf) for Holding Dental Instruments, Associated with
a Dental Unit, and System for Returning Instruments That Can Be
Pulled and Drawn Out of This System**

[Coffret (ou tablette) porte instrument dentaire, associé à un
équipement dentaire, et system de rappel des instruments
susceptibles d'être tirés et rappelés hors de celui-ci]

Léo Sedan Seidman

UNITED STATES PATENT AND TRADEMARK OFFICE

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<u>Inventor</u>	:	Léo Sedan Seidman
<u>Applicant</u>	:	Léo Sedan Seidman
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<u>Application Date</u>	:	June 12 th , 1973
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<u>Foreign Language Title</u>	:	Coffret (ou tablette) porte instrument dentaire, associé à un équipement dentaire, et system de rappel des instruments susceptibles d'être tirés et rappelés hors de celui-ci
<u>English Title</u>	:	Case (or Shelf) for Holding Dental Instruments, Associated with a Dental Unit, and System for Returning Instruments That Can Be Pulled and Drawn Out of This System

The present invention relates to a dental unit whose case or shelf holds instruments [and that] is connected by an articulated (counterbalanced and pivoting) arm to a cabinet located on the side of the dental chair or to a column attached to the dental chair.

Said instrument-holding case stays in a horizontal position regardless of the upward or downward movement of the arm and regardless of the rotation of the case attached to a spindle to the front end of the articulated arm.

The instrument-holding case or shelf according to the invention does not contain any type of return system (reel, springs, etc.) in its body; rather, it is exterior to it. The dental instruments, connected to flexible leads, may be pulled and drawn out of the front face of the case, which makes the case or shelf as lightweight as possible, as well as making it thinner, lighter, and less bulky, thus conferring great maneuverability to the shelf.

In devices of this type, the instrument-holding case contains in its body mechanisms for returning dental instruments that are connected to flexible leads (spring-loaded reel,

¹ Numbers in the margin indicate pagination in the foreign text.

spring-loaded spindle, etc.), which limits the installation of a greater number of dental instruments at the expense of the volume and weight of the case. Additionally, all of the flexible leads that supply the dental instruments are grouped into a sheath containing at least 4 or 5 pipes; this sheath is attached to the articulated arm, which interferes with the movement of this arm that supports the case.

Another known design includes a single supply sheath connected to a lighter, flatter shelf, but the disadvantage resides in the fact that the dental instruments connected to their flexible lead are attached to and suspended on supports to the right and left of the shelf and are not pulled out or returned, such that the flexible leads hang in front of and alongside the shelf, which interferes with handling and moving said shelf and is bothersome to the patient seated or reclining on the dental chair.

/2

The devices of the invention eliminate these disadvantages. In these devices, it is possible to pull out the dental instruments from the front face of the instrument-holding case or shelf and to return them back into the case or shelf, because the flexible leads (variable in length) that are connected at one end to the dental instruments pass right through the case,

exiting to the rear guided by sheaths, tubes, pulleys, and guides that are lateral to the pulleys, enabling the vertical descent of the flexible leads at the rear of the case and allowing them to ascend towards a cabinet or a column, placed next to the dental chair and to which the other ends of the flexible leads are attached and connected.

The case is itself connected to this (stationary or mobile) cabinet or to the column via an articulated arm composed of two (or several) counterbalanced arms. This keeps the flexible leads from hanging in front of the instrument-holding shelf or case. By varying the length of the instrument-holding case, the flexible leads are kept at a greater distance to the rear from the front of the shelf. This distancing of the flexible leads can be carried out either by extending the case towards the rear or by any other non-limiting system, such as a parallel spindle attached to the rear of the case, etc. Returning the instruments can be carried out either by the weight of the flexible leads that hang behind the case or by a counterweight mounted on the conductor, or by reels with energy-accumulating springs placed inside the cabinet next to the dental chair, etc.

Thus, the flexible conductors will be directly connected to the cabinet or column inside which the mechanisms needed to start up the dental instruments are found. The instrument-

holding case or shelf will therefore not have a heavy or cumbersome return system in its body, which makes it possible to reduce the volume and thickness of the instrument-holding case and to increase the number of dental instruments such as micromotors, turbine contra-angles, a multi-function syringe, a surgical aspiration lead, gas, etc. The device of the invention includes (by way of non-limiting example) a fixed or mobile cabinet, inside which is placed the mechanism for startup of the dental instruments. To this cabinet (or from a column placed on the base of the dental chair) are attached and connected: by their rear end, the flexible leads (water - air - gas - electricity, etc.), of variable length, and to the front end of which leads the dental instruments are attached. These instruments, thus attached to their flexible lead traversing an instrument-holding case or shelf by the rear face and exit by the front face of the case; a stop prevents the instruments from gliding towards the rear; also, an arm composed of one or several articulated and pivoting arms. These arms have lateral (horizontal) movements at the level of the pivot spindles that connect them; these arms are also articulated from bottom to top due to the fact that they are counterbalanced parallelograms. The instrument-holding case is attached to the end of this arm; the case pivots horizontally around a vertical axis. Thus, the

instrument-holding case or shelf will remain in a horizontal position regardless of its overshoot. Thanks to the light weight and easy handling of the instrument-holding case, it can be placed in any position near the operation area (the patient's mouth), making it easy for the practitioner to handle the various instruments depending upon whether he is seated or standing.

/3

According to a (non-limiting) embodiment of the invention, return of the instruments that can be pulled out of the front of the case or shelf is carried out by the weight of the flexible tubes that hang behind the case, or by a counterweight located at the lowest level of the flexible leads, which hang, given their linkage, between the instrument-holding case and the cabinet on which are located the devices for connecting the power supply and for attaching the flexible leads.

/4

Return of the instruments can be carried out using coil springs whose diameter is slightly greater than [that of] the flexible leads. These springs are attached to the cabinet (or to the column), mounted, and attached around the supply connections such that one may also mount the flexible leads inside these coil springs (by the end opposite the one to which the

instrument is attached) and therefore connect the flexible leads to the supply connections located on the cabinet. These flexible coil springs (of variable length) will act on the leads as counterweights and as return springs for the instruments.

The return operation of the instruments according to the invention is as follows: the instruments are placed on the front face of the case; these instruments are connected to flexible leads (flexible tubes, pressurized air and water conductors, and electricity conductors); these conductors enter the instrument-holding case via openings made in the front face and exit via the opposite face of the case, descending as low as possible (along a curve), and then reascending to be connected to the cabinet or to the column mounted in a coil spring, also attached to the cabinet. Guiding of the flexible leads that traverse the case is carried out by means of tubes (parallel along a horizontal plane) that also traverse the inside of the case in the extension of the openings used for housing the dental instruments. These tubes are bent downwards at the level of the rear face of the case; these parallel tubes are attached to the case inside rings, inside of which they can pivot horizontally such that the bends can assume a horizontal position. The leads slide inside these tubes when one pulls the instrument (to which it is attached) out of the instrument-holding case. The

instrument is then returned by the weight of the lead and by the coil spring, which can also act as a return counterweight. This return counterweight is adjustable such that it can compensate for the weight of the instruments, making them light and easy to handle. Another embodiment replaces the bends of the tubes with grooved idler pulleys, placed vertically to the rear of the case in the extension of the straight guide tubes, such that the flexible leads are held in the grooves, which facilitates the vertical descent of the leads. Cylindrical rollers mounted to pivot on spindles can be placed on either side of these pulleys in order to keep the flexible leads from falling out of the pulley grooves when the instrument-holding case is pivoted horizontally. Another embodiment of the invention consists of attaching the coil springs under the shelf at the rear, such that the leads are connected, mounted across these coil springs, to supply connections that are attached onto the rear base of the case. The flexible leads (sheathed and mounted in the coil springs) descend inside these springs and then reascend vertically outside of the springs and enter through the rear face of the case by being held inside the grooves of the pulleys or by entering the guide tubes (horizontally) and exit, connected to the instruments, via the front face of the case. The instruments pulled out of the case are returned by the coil

springs that, after they have flexed, tend to come back to their initial rigid position. Supplying the instruments is carried out by a large flexible lead that connects the cabinet to the case. Another embodiment consists of placing inside the cabinet reels with energy-accumulating springs that return the flexible leads.

/5

The attached drawings illustrate, by way of non-limiting example, the various embodiments in accordance with the present invention.

Figure 1 shows an entire dental unit, with the dental chair in place. Figure 2 shows a view of the instrument-holding case with its cover removed.

/6

Figure 3 shows the case and its support arms attached to a column attached to the chair 10.

As shown in Figures 1 and 3, the case 1 is connected to the cabinet 6 (or the column 6b) by an arm composed of arms 7 and 8. These arms pivot horizontally: the arm 7 on the pivot 5 attached to the cabinet 6, and arms 7 and 8 are attached by the pivot 13. The case 1 also pivots horizontally on a pivot pin 11 at the end of the arm composed of arms 7 and 8. Arms 7 and 8 are articulated (upward and downward) parallelograms and form counterbalanced arms returned by springs. The case 6 will keep a

horizontal position regardless of the movements of the arms 7 and 8 that make up the arm.

/6

The dental instruments 9, Figures 1 and 2 [sic] are housed on the front face 14 of the case 1 in openings 16, extended towards the inside of the case by guide tubes 12. These instruments 1 [sic] are attached and extended by flexible leads 3 that slide into the tubes 12 and exit towards the rear face 15 of the case 1, held in the grooves of the pulleys 2. These pulleys 2 are placed vertically inside the case 1, along a lateral axis 21.

These flexible leads 3 descend vertically along a given length starting from pulleys 2 placed to the rear of the case 1, and then reascend mounted in a sheath that is a coil spring. The spring 4 and the lead 3 are connected at the point 17 of the cabinet 6 inside which the mechanism for supplying and starting up the instruments 9 is located.

The instruments 9 can be pulled out of the case through openings 16; the leads 3 come along with them. The return of the instruments 9 is carried out by means of the coil spring 4 (attached to the connection point 17) that regains its initial position when it is flexed upwards by exerting tension on the lead 3.

As shown in Figure 1, the dental instrument 9, the lead 3, the pulley 2, and the spring 4 are located along a vertical plane that is perpendicular to the front face of the case (which can also be a straight rectangular parallelepiped) and of the cabinet 6, which facilitates the tension and return of the instruments 9. If the case is made to pivot horizontally at 90°, the instruments 9 and the leads 19 that are inside the case will be perpendicular, following the flexible leads 4 that hang behind the case and that are connected to the cabinet 6. The flexible leads may be dislodged from the groove of the pulley 2; this disadvantage has been resolved by placing guide rollers 11 on either side of the pulleys 2.

/7

Figure 2 shows another embodiment of the system for returning the instruments: the coil spring 4 inside which the lead 3 is housed are [sic] connected 17 (perpendicular or oblique) [text missing] they hang behind the case attached to the base 20 of the case 1. The lead 3 enters by the rear face 15, held in the groove of the pulley 2 and exiting by the front face 14 of the instrument-holding case 1 through the openings 16 that house the instruments 9. The coil springs 4 inside of which the leads are partially mounted bend when the instrument 9 is pulled out of the case 1. The return of the instrument 9

(attached to the variable-length flexible lead 3) pulled out of the case 1 is carried out by the tension that the coil spring exerts; after flexing, it returns to its initial position. Figure 3 shows the case 1 connected to a column 6b by the same arms 7 and 8.

/8

CLAIMS

1. The present invention concerns a dental unit composed a mobile [or] fixed cabinet that can be placed to the right or left of a dental chair. The cabinet is topped by an arm (composed of arms articulated upwards and downwards) and pivoting) [sic], to the end of which a dental instrument-holding case or shelf is attached. The shelf thus attached will stay in a horizontal position regardless of horizontal and vertical displacements and pivoting of the shelf attached to a pin at the end of the arm.

This instrument-holding shelf or case through which dental instruments, connected to flexible leads (rubber tubes or electrical cords, etc.), can be pulled out of and returned to this case [sic]. This instrument-holding case is characterized by the fact that it has no instrument return system (spring-loaded reel, etc.) in the body of the case itself, which decreases its volume and thickness and makes it possible to

increase the volume of instruments as needed without making the case heavier, thus making it easier to handle. This is because the flexible leads to which the instruments are attached traverse the case by entering via the front face of the case and exiting via the rear face, and because the device for returning the instruments involves (non-limiting) return mechanisms that are exterior to the case.

2. Device according to Claim 1, wherein the flexible leads slide freely inside the case in tubes, or held in idle pulleys placed in the extension of the openings used to house the instruments.

3. Device according to Claim 1, wherein the flexible leads descend vertically inside at the rear of the case and reascend along a curve and are connected to the cabinet where the mechanisms for starting up the instruments and for supplying the leads are located.

/9

4. Device according to Claim 1, wherein the return of the instruments pulled out of the case is carried out by the weight of the leads that hang behind the case.

5. Return device according to Claim 1, wherein the return counterweight can be placed at the lowest level of the curve that the connected flexible lead forms from the case to the

cabinet. The counterweight can be replaced with a coil spring that is partially mounted to the rear of the lead; since the latter is connected to the cabinet, the coil spring exerts tension on the lead[.]

6. Device for returning instruments wherein the rear part of the lead and of the coil spring inside which it is mounted can be connected not to the cabinet, but to the rear base of the instrument-holding case.

7. Return device according to Claim 6, wherein the flexible lead, partially mounted inside the coil spring attached to the base of the case (to the rear) keeps this part of the lead in a position that is perpendicular or oblique to the base of the case. The return of the instrument is carried out after the spring flexes; the spring tends to return to its vertical position when the instrument is pulled out of the case.

8. Device according to Claims 1 through 7, wherein the instrument-holding case is supplied by several individual (or grouped) flexible leads, enabling it:

1. - To pivot horizontally on a spindle attached to the end of an arm (attached to the variable-length arm).
2. - thus attached, this case can be moved up or down or to the right or left.

FIG. 1

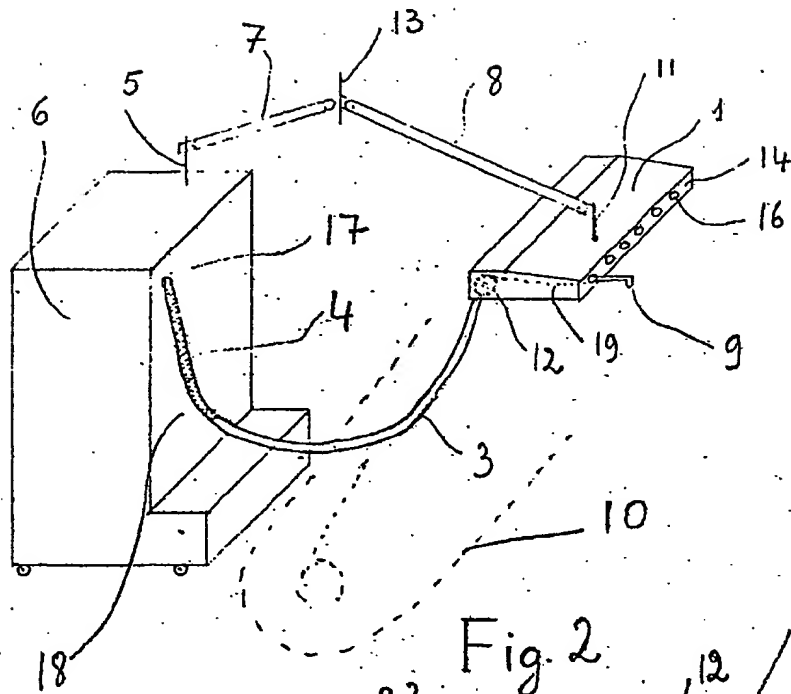
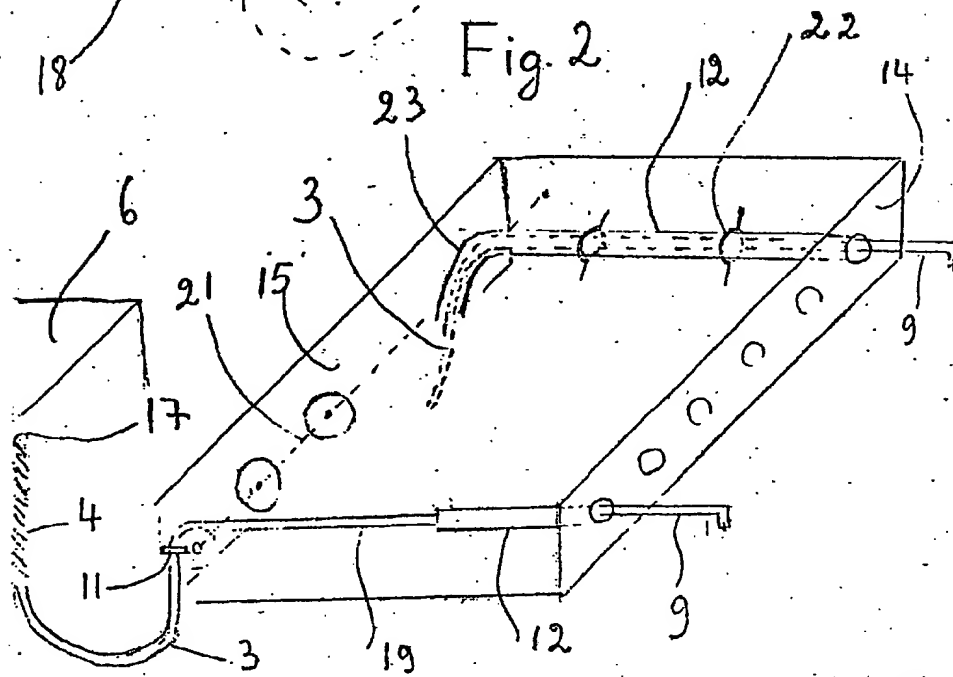


Fig. 2



BAD ORIGINAL

